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Pesticide Fact Sheet Number 57
Chlorpyrifos-methyl

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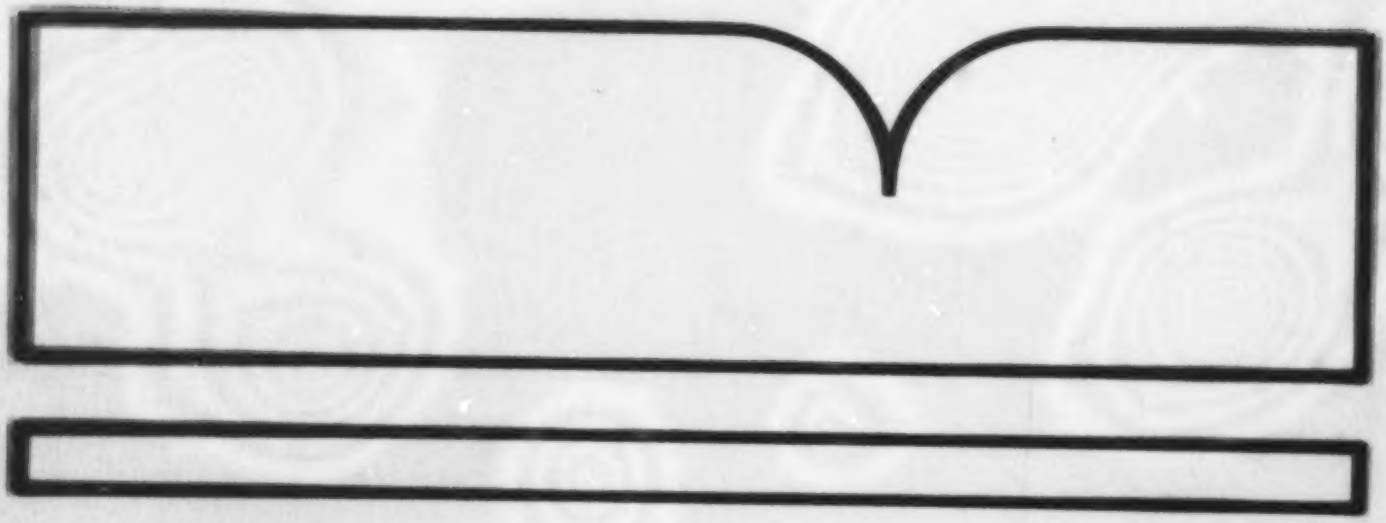

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16. Abstract (Limit: 200 words)

This document contains up-to-date chemical information, including a summary of the Agency's regulatory position and rationale, on a specific pesticide or group of pesticides. A Fact Sheet is issued after one of the following actions has occurred.

1. Issuance or reissuance of a registration standard,
2. Issuance of each special review document,
3. Registration of a significantly changed use pattern,
4. Registration of a new chemical, or
5. An immediate need for information to resolve controversial issues relating to a specific chemical or use pattern.

17. Document Analysis a. Descriptors

Pesticides, regulations, Chemical Information Fact Sheet, Use Patterns, Science Findings

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

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Office of Pesticide Programs (TS-768C)
Washington, DC 20460

EPA

Pesticide Fact Sheet

Name of Chemical: Chlorpyrifos-methyl
Reason for Issuance:
Date Issued: June 30, 1985
Fact Sheet Number: 57

1. DESCRIPTION OF CHEMICAL

Generic Name: O,O-dimethyl O-(3,5,6-trichloro-2-pyridyl) phosphorothioate

Common Name: Chlorpyrifos-methyl

Trade Name: Reldan

EPA Shaughnessy Code: 059102

Chemical Abstracts Service (CAS) Number: 510.0

Year of Initial Registration: 1985

Pesticide Type: Insecticide

Chemical Family: Organophosphate

U.S. Producer: Dow Chemical U.S.A.

2. USE PATTERNS AND FORMULATIONS

Application Sites: Grains of rice, barley, oats, wheat, and grain sorghum intended for storage, empty grain storage bins, and equipment.

Types of Formulations: Emulsifiable concentrate and dusts

Types of Methods of Application: Spray and dusts

Application Rates: 1.4-5.0 oz. active ingredient/1000 bushels of grain
1% spray or 2-3% dust to grain equipment and storage walls/floors

Usual Carriers: petroleum solvents and usual clay carriers

3. SCIENCE FINDINGS OF TECHNICAL CHEMICAL

Summary Science Statement

Chlorpyrifos-methyl is an organophosphate compound with moderate acute toxicity to both humans and wildlife species. The registered use precludes exposure to wildlife.

Chemical Characteristics

Physical State: Granular crystalline solid

Color: White

Odor: Mild mercaptan

Molecular weight and formula: 322.6 - $C_7H_7Cl_3NO_3PS$

Melting point: 45.5 - 46.5° C

Vapor Pressure: 7.40×10^{-7} mm Hg at 0° C

Solubility in various solvents:

Solubility:	g/100g of solvent at 24° C
Water	-0.0004
Acetone	-640
Benzene	-520
Ethyl alcohol	-30
Chloroform	-350

Toxicology Characteristics

Acute Oral: 1530 mg/kg, Toxicity Category III

Acute Dermal: greater than 2000 mg/kg, Toxicity Category III

Primary Dermal Irritation: Slight irritant-Toxicity Category III

Primary Eye Irritation: Slightly irritant-Corneal opacity persisted for 7 days. Toxicity Category III

Skin Sensitization: Positive

Acute Inhalation: 0.67 mg/l, Toxicity Category II

Neurotoxicity: Not an acute delayed neurotoxic agent at doses up to 500 mg/kg/day

Oncogenicity: Not shown to be an oncogen in rat or mouse studies at dose levels up to 3.0 mg/kg/day and 9.0 mg/kg/day (highest dosages tested), respectively

Teratogenicity: The Agency has determined that this chemical is not teratogenic at levels up to 200 mg/kg/day in rats and >16 mg/kg/day in rabbits (highest dosages tested)

Reproduction-3 generation: Studies adequately demonstrate that chlorpyrifos-methyl does not produce reproductive effects. No effects were demonstrated at dose levels up to 3.0 mg/kg/day (HDT)

Metabolism: The studies suggest that chlorpyrifos-methyl is rapidly excreted and there is no bioaccumulation

Mutagenicity: Data gap- These data are to be submitted in June of 1985

Physiological and Biochemical Behavioral Characteristics

Mechanism of Pesticidal Action: An insecticide which is active by contact, ingestion, and vapor action and causes phosphorylation of the acetylcholinesterase enzyme of tissues, allowing accumulation of acetylchloline at cholinergic neuro-effector junctions (muscarinic effects), and at skeletal muscle myoneural junctions and autonomic ganglia. Poisoning also impairs the central nervous system function.

Symptoms of poisoning include: headache, dizziness, extreme weakness, ataxia, tiny pupils, twitching, tremor, nausea, slow heatbeat, pulmonary edema, and sweating. Continual absorbtion at intermediate dosages may cause influenza-like illness which includes symptoms like weakness, anorexia, and malaise.

Metabolism and Persistence in Plants and Animals:

The metabolism of chlorpyrifos-methyl is adequately defined. A tolerance for stored grain has been established.

Environmental Characteristics

This use pattern precludes exposure to the environment. Therefore, most environmental effects are uncharacterized.

Ecological Characteristics

Avian acute oral:
Mallard Duck--1590 mg/kg

Avian dietary:
Mallard duck--5620 ppm
Bobwhite quail--2010 ppm

Freshwater Fish:
Coldwater fish (rainbow trout)--0.014 ppm
Warmwater fish (bluegill sunfish)--0.88 ppm

Acute Freshwater Invertebrates:
Daphnia--1.08 ppb

Tolerance Assessment

The tolerance for chlorpyrifos-methyl has been assessed according to the new Tolerance Assessment System (TAS). Under this method of analysis, the TMRC value for stored grain and grain product is 0.327 mg/day and the occupied ADI is 54 percent for the average U.S. population. The traditional system for figuring the TMRC gives an occupied ADI of 190%.

5. SUMMARY OF MAJOR DATA GAPS

No major data gaps, only mutagenicity studies

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